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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,158	10/16/2003	Hryhory T. Koba	17310-281350	6636

25764 7590 08/04/2005

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EXAMINER	
CHAUDHRY, SAEED T	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 08/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/687,158	KOBA ET AL.	
	Examiner	Art Unit	
	Saeed T. Chaudhry	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) 15-18 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-14 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) 1-18 are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 1/5/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restriction

Restriction to one of the following inventions is required under 35 U.S.C. 121:

Group I, Claims 1-14, drawn to a method of cleaning an contaminated surface, classified in Class 134, subclass 1.

Group II, Claim 15-18, drawn to a head suspension, classified in Class 360, subclass 254.

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (M.P.E.P. § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process such as recording on a disk.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, have acquired a separate status in the art because of their recognized divergent subject matter, the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Robert B. Leonard on July 19, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-14. Affirmation of this election must be made by applicant in responding to this Office action. Claims 15-18 are withdrawn from further consideration by the Examiner, 37 C.F.R. § 1.142(b), as being drawn to a non-elected invention.

Joint Inventors

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 C.F.R. § 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the

application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 C.F.R. § 1.48(b) and by the fee required under 37 C.F.R. § 1.17(h).

Claim Rejections - 35 USC § 112

Claims 6 and 12 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "generally" in claims 6 and 12 render the claims indefinite since the resulting claim does not clearly set forth the means and bounds of the patent protection desired.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (c) he has abandoned the invention.
> (d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States.
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.
> (f) he did not himself invent the subject matter sought to be patented.
> (g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

Claims 1-4 and 9-11 are rejected under 35 U.S.C. § 102(b) as being anticipated by Albrecht et al.

Albrecht et al (6,288,876) discloses a head suspension for a rigid disk drive, which include all the components as claimed herein. The reference discloses a lift tab for a load/unload

type of data storage hard drive and a method of smoothing the lift tab. The method includes the step of striking the lift tab with short duration (e.g. 10-500 nanosecond) energy pulses to melt a thin surface layer of the lift tab. The melted layer flows under surface tension forces, smoothing out bumps and scratches. The melted layer quickly refreezes, forming an exceptionally smooth melted and refrozen spot. Preferably, the melted and refrozen spot is 0.2-10 microns deep. More preferably, the melted and refrozen spot is in the range of 1.0 to 3.0 microns thick. The size of the melted and refrozen spots is practically limited by power available from energy sources such as lasers. Preferably, the melted and refrozen spots are at least several tens of microns in diameter. Also, the present invention includes head gimbal assemblies and hard drives having lift tabs with melted and refrozen spots (see abstract).

FIG. 8 shows a head gimbal assembly 54 having the lift tab 20 smoothed according to the method of the present invention. The head gimbal assembly includes a mounting portion 56 for attachment to a rotary actuator (not shown) inside a data storage hard drive. A rigid arm 58 and flexible suspension 60 are attached to the mounting portion 56. The flexible suspension 60 supports a slider 62 which comprises a magnetic read/write head (not shown). The lift tab 20 is attached to the flexible suspension such that the lift tab can cause the flexible suspension to bend slightly when subject to a force (see col. 8, lines 1-11).

In a specific implementation of the present method, a multimode frequency doubled Nd:YLF (527 nm) laser is used. The pulse duration is 200 ns at a repetition rate of 100 Hz. The laser pulses are focused to a spot size of about 300 microns by 70 microns. The pulse energy incident on the lift tab is 2.8 millijoules per pulse (see col. 7, lines 58-62).

When the energy pulse strikes the lift tab surface, melted material flows away from the melted spot due to thermal expansion. The melted material then refreezes rapidly due to fast heat diffusion. This creates roughness with a length scale comparable to the spot size (and ripples 36 shown in FIG. 4). Therefore, it is desirable in the present method for each melted spot 28 to be as large as practically possible (see col. 7, lines 18-30).

As a specific example on stainless steel using 527 nm laser light, a 10 nanosecond energy pulse duration at about 130 Mw/cm.sup.2 produces melted spots having melted depth of about 0.7 micron. A 200 nanosecond pulse duration at about 70 Mw/cm.sup.2 produces melted spots having melted spot depth of about 2-3 microns (see col. 5, lines 59-64).

Albrecht et al discloses all the limitation as claimed herein. The reference specifically did disclose to clean the contaminated surface of the head suspension but since the reference discloses to irradiating pulses of a laser beam on the lift tab, which inherently clean the contaminated surface. The reference discloses that it is desirable for each melted spot to be as large as practically possible. Therefore, single pulse extend across the entire contaminated surface.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made

The factual inquiries set forth in Graham v. John Deere Co., 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness.

Claims 5-8 and 12-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Albrecht et al in view of Hosoya et al.

Albrecht et al were discussed supra. However, the reference fails to disclose a step of interposing a mask between a source of laser beam and the surface to be cleaned.

Hosoya et al (5,319,183) disclose a method for cleaning a printed wiring board, wherein a pulsed laser beam is irradiated onto a printing wiring board to evaporate the irradiated portion. A laser beam irradiating apparatus 2 emits a laser beam to a pattern spot on the wiring board placed on the XY stage 1. The laser beam apparatus comprising a laser oscillator 21 and a laser beam masking apparatus 22, and is connected to a laser controller 23 and mask size controller 24. The laser controller 23 controls the number of oscillations and the output of the laser oscillator 21. The mask size controller 24 controls the opening length L and width W of the laser beam masking apparatus 22. The controller 24 controls the laser beam masking apparatus 22 in a such as way that during a removal pf molten substances, the irradiation area is enlarged (see col. 6, lines 35-44 and Fig. 4).

It would have been obvious at the time applicant invented the claimed process to incorporate a mask between the source of laser beam and the surface or between the lens and the surface as disclosed by Hosoya et al into the process of Albrecht et al to control the size of the laser beam for the contaminated surface such that the only contaminants are irradiate by the laser beam, which would protect the other area from damage.

The Prior art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Engelsberg (5,024,968) disclose a method for removing surface contaminants from the surface of a substrate by a pulsed laser.

Boszormenyi et al (6,394,105) disclose a method of cleaning a surface by a laser source and measure the effect of the cleaning.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saeed T. Chaudhry whose telephone number is (571) 272-1298. The examiner can normally be reached on Monday-Friday from 9:30 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Michael Barr, can be reached on (571)-272-1414. The fax phone number for non-final is (703)-872-9306.

When filing a FAX in Gp 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1700.

Saeed T. Chaudhry
Patent Examiner

MICHAEL BARR
SUPERVISORY PATENT EXAMINER